

School of Economics and Finance  
**FINA 304 FINANCIAL ECONOMETRICS**  
Trimester One 2011  
**COURSE OUTLINE**

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**Course coordinator, lecturer and tutor**

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**Class times and rooms:**

Lectures: Tuesday and Friday, 08:30-09:20, RWW315

Tutorial: Monday, 10:30-11:20, RWW202

**Trimester Dates**

*Teaching Period:* Monday 28 February - Friday 3 June

*Study Period:* Monday 6 June - Thursday 9 June

*Examination Period:* Friday 10 June - Saturday 2 July (inclusive)

**Course Learning Objectives**

1. document properties of various types of financial data and analyse them with the appropriate econometric tools
2. understand and apply maximum likelihood estimation
3. estimate ARCH and GARCH models

**Course delivery**

This course will be delivered by two lectures per week and a tutorial in 8 out of the 12 weeks.

**Readings**

The text is: Stephen J. Taylor, *Asset Price Dynamics, Volatility, and Prediction*, Princeton University Press, 2005, ISBN 0-691-11537-0.

The VUW library has a web page that contains detailed information about library resources and has links to other sites. Its URL is <http://www.vuw.ac.nz/library>

**Course content**

Chapter references are to Taylor. You should prepare for each lecture by skim-reading the indicated textbook sections - do not try to read it in detail until *after* the lecture.

Date	Lecture	Topic	Text
1 Mar	1	Prices	2.1-2.4
4 Mar	2	Returns	2.5-2.6
8 Mar	3	Random variables and their properties	3.1-3.2
11 Mar	4	Time series processes: white noise, ACF, stationarity	3.3-3.4
15 Mar	5	The random walk model	
18 Mar	6	AR(1) process	3.5
22 Mar	7	MA(1), ARMA(1,1)	3.5-3.8
25 Mar	8	MLE for ARMA models	
29 Mar	9	Stylized facts: moments, calendar effects	4.1-4.6
1 Apr	10	Distribution of returns	4.7-4.8
5 Apr	11	Autocorrelation of returns, transformed returns	4.9-4.10
8 Apr	12	Random Walk Hypothesis, variance ratio tests	5
12 Apr	13	Further tests of the RWH	6, 7
15 Apr	14	Conditional heteroscedasticity, ARCH(1)	9.1-9.2
<i>Mid -trimester break, 18 April - 1 May</i>			
3 May	15	GARCH(1,1)	9.3
6 May	16	GARCH(1,1) model ctd	9.3-9.4
10 May	17	MLE for GARCH models	10.4
13 May	18	GARCH model building	10.6
17 May	19	Continuous time stochastic processes	13.1-13.3
18 May	20	Visualising Brownian motion	13.7
24 May	21	Itô's Lemma, GBM and returns	13.3
25 May	22	The Black-Scholes valuation equation, implied volatility	14.1-14.4
31 May	23	The Ornstein-Uhlenbeck process	13.3
1 June	24	Review	
<i>Examination, see <a href="http://www.victoria.ac.nz/timetables/index.aspx">http://www.victoria.ac.nz/timetables/index.aspx</a></i>			

The following chapters are not covered in this course: § 8, 11-12, 15-16. These chapters will form the basis of FINA411 from 2012. Lecture materials will be supported by practice in the lab tutorials, and through tutorial assignments.

### Tutorial problems

There will be a tutorial problems assigned in advance of each tutorial. These do not count towards assessment, but will be an important part of your preparation for the test and exam. The tutorial schedule, and tutorial problems will be distributed via Blackboard.

### Expected workload

In weeks when there is a tutorial you should spend 3 hours in class per week (2 lectures and 1 tutorial); in the remaining weeks you should spend 2 hours in class per week (2 lectures). You should expect to spend an additional 6-8 hours per week reading, studying and completing assignments. Overall it is expected that you will spend approximately 150 hours on completing this course.

### Materials and Equipment

It will be useful for you to have access to the statistical software R on your personal computer. Bring a memory stick to John and he will provide you with an installation file. Alternatively, if bandwidth is not an issue, download it from <http://www.r-project.org/>.

## **Assessment Requirements**

- There will be two practical assignments. The first will focus on testing the Random Walk Hypothesis, and will be due at lecture 15, on Tuesday 3 May. The second will focus on the GARCH(1,1) model and will be due at lecture 21, on Tuesday 24 May. *Each assignment is worth 10% of your final grade.*
- A two-hour in-term test will be held in Week 7, and will cover content from lectures 1 to 11 inclusive. *This test is worth 40% of your final grade.*
- The final exam will be two hours. *This exam is worth the remaining 40% of your final grade.*

All assessment addresses CLO1 and 2. CLO3 is assessed in the second assignment and the exam.

Your assessed work may be used for quality assurance purposes, such as to assess the level of achievement of learning objectives as required for accreditation and audit purposes. The findings may be used to inform changes aimed at improving the quality of FCA programmes. All material used for such processes will be treated as confidential, and the outcome will not affect your grade for the course.

## **Penalties**

Late assignments will have 10% deducted per day for the first 5 weekdays, and will be given 0 thereafter. Extensions must be negotiated by close of business Friday preceeding the due date.

## **Examinations**

Students who enrol in courses with examinations are obliged to attend an examination at the University at any time during the formal examination period. The final examination for this course will be scheduled at some time during the period from Friday 10 June - Saturday 2 July 2011.

## **Group work**

None

## **Mandatory course requirements**

None

## **Class representative**

A class representative will be elected in the first week, whose name and contact details will be made available to VUWSA, the Course Coordinator and the class. The class representative provides a communication channel to liaise with the Course Coordinator on behalf of students.

## **Communication of additional information**

Additional information will be conveyed to students via Blackboard and/or email.

Emails may be sent to the address that you supplied with your enrolment; but they may also be sent to your SCS email address, which is your official university email address. You should keep an eye on both email addresses.

## **Withdrawal from Course**

1. Your fees will be refunded if you withdraw from this course on or before 11 March 2011.

2. The standard last date for withdrawal from this course is 14 May. After this date, students forced to withdraw by circumstances beyond their control must apply for permission on an '*Application for Associate Dean's Permission to Withdraw Late*' including supporting documentation.

The application form is available from either of the Faculty's Student Customer Service Desks.

**For the following important information follow the links provided:**

### **Academic Integrity and Plagiarism**

<http://www.victoria.ac.nz/home/study/plagiarism.aspx>

### **General University Policies and Statutes**

Find key dates, explanations of grades and other useful information at

<http://www.victoria.ac.nz/home/study>

Find out about academic progress and restricted enrolment at

<http://www.victoria.ac.nz/home/study/academic-progress>

The University's statutes and policies are available at

<http://www.victoria.ac.nz/home/about/policy>,

except qualification statutes, which are available via the Calendar webpage at

<http://www.victoria.ac.nz/home.study/calendar> (See Section C)

Further information about the University's academic processes can be found on the website of the Assistance Vice-Chancellor (Academic) at

[http://www.victoria.ac.nz/home/about\\_victoria/avcacademic/default.aspx](http://www.victoria.ac.nz/home/about_victoria/avcacademic/default.aspx)

### **AVC (Academic) Website: information including: Conduct, Academic Grievances, Students with Impairments, Student Support**

[http://www.victoria.ac.nz/home/about\\_victoria/avcacademic/Publications.aspx](http://www.victoria.ac.nz/home/about_victoria/avcacademic/Publications.aspx)

### **Faculty of Commerce and Administration Offices**

<http://www.victoria.ac.nz/fca/studenthelp/>

### **Manaaki Pihipihinga Programme**

[http://www.victoria.ac.nz/st\\_services/mentoring](http://www.victoria.ac.nz/st_services/mentoring)